Notebook, N-89-12-13

This notebook covers the period December 1889-August 1890. It was used by Arthur E. Kennelly, Charles Batchelor, and an unidentified draftsman (probably George Mayer) as a rough record book in the Galvanometer Room. The book contains notes, drawings, and calculations regarding magnetic belts for power transmission for the electric railway. Transcriptions of some of these records can be found in Arthur E. Kennelly Notebooks #2 and #3. There are also entries relating to conductivity tests on copper and tin-plated wire, along with various other electrical experiments. Transcriptions of this material can be found in the two Kennelly notebooks. The front cover is labeled "#577." The pages are unnumbered, and some pages have been removed from the book. Approximately 80 pages have been used.

Only the material not transcribed in the Kennelly notebooks has been filmed.

2. 1.90

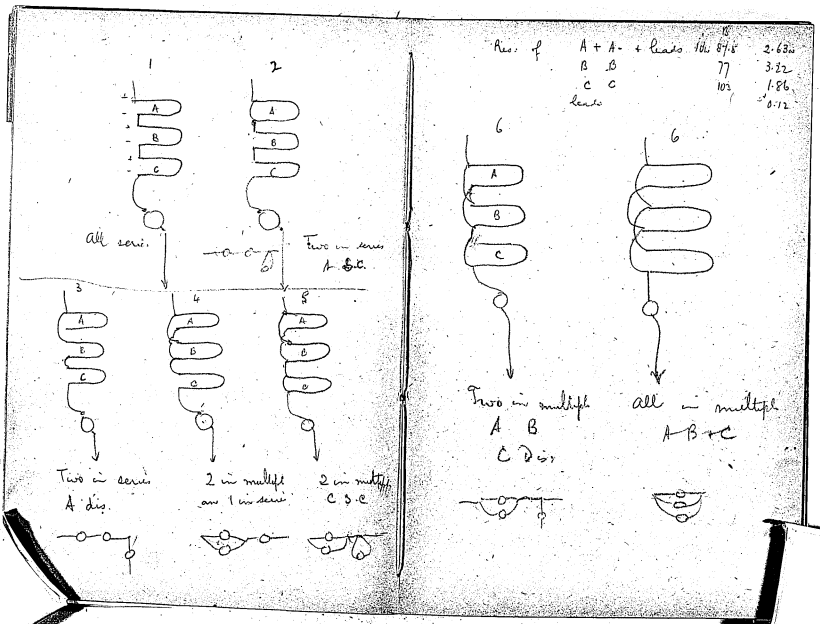
Whole res with leads 1 - ~~106 0.54~~ 194

1
2 0.1w 103 A 753 = 0.56 47 103 A 16

1 all res. with leads 1w A 116
2 112
3 106
4 99
5 89
6 74
7 49
8 last one 2
9 2 1w { B45 0.1w { 103 A
10 72 A
11 —
12 56 A
13 —

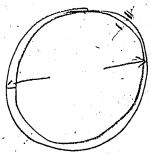
7.45
6.69
5.82
4.77
3.76
2.90
1.94
0.99
0.51
0.29
0.20
0.04

1460 - two 20.5 volts
975 tach.


1
2
A
B
C
All series
Two in series
A & B
3
4
5
Two in series
A dis.
2 in multiple
on 1 in series
2 in multiple
C & E
Res. of
A + A-
B B
C C
leads
Ω
Vol. 87.6
77
103
2·63Ω
3·32
1·86
0·12
6
6
Two in multiple
A B
C Dis.
All in multiple
A B + C

110 volt	1	640	560
	2	760	680
	3	760	700
	4	780	720
	5	960	920
	6	960	950
	7	1100	1080

2.63 finish 3 $\frac{1}{64}$ outside



3 $\frac{3}{64}$
2.63

2.38
2.42

2.40
2.38
2. Then the rubber must be

O.D. $2\frac{63}{64}$

I.D. $2\frac{42}{64}$

$$\left(\frac{E - cw}{b + \beta w^2}\right) cw = W$$

$$Ecw - c^2w^2 = W(b + \beta w^2)$$

$$w^2(W\beta + c^2) - Ecw = -Wb$$

$$w^2 d - Ecw = -Wb$$

$$w^2 - \frac{E}{d} w = -\frac{Wb}{d}$$

$$w^2 - \frac{E}{d} w + \frac{c^2}{4d^2} E^2 = \frac{E^2 c^2}{4d^2} - \frac{4Wbd}{4d^2}$$

$$w - \frac{c}{2d} E = \frac{\sqrt{E^2c^2 - 4Wbd}}{2d}$$

$$w = \frac{cE}{2d} \pm \frac{\sqrt{E^2c^2 - 4Wbd}}{2d}$$

$$= \frac{E\varphi n \pm \sqrt{E^2\varphi^2 n^2 - 4Wb(W\beta + \varphi^2 n^2)}}{2(Wb + \varphi^2 n^2)}$$

When $b = 0$ $\quad w = \frac{E\varphi n}{2\varphi^2 n^2} = \frac{E}{2\varphi n}$

Suppose $E = \varphi^2 n^2 w$

$$w = \frac{\varphi n w}{\varphi n^2} = \frac{w}{2}$$

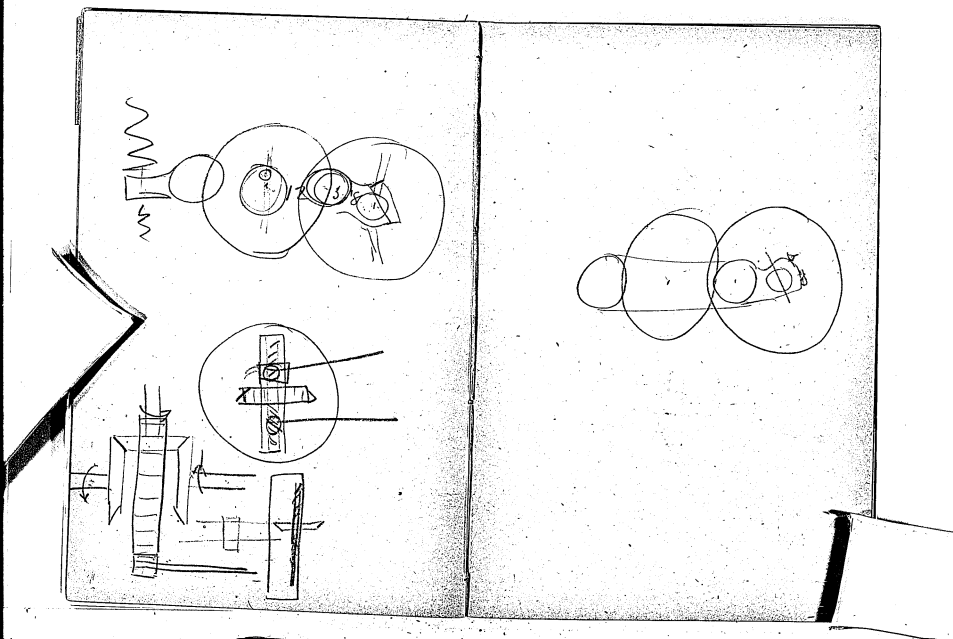
Efficiency of the system $= \frac{e}{E}$

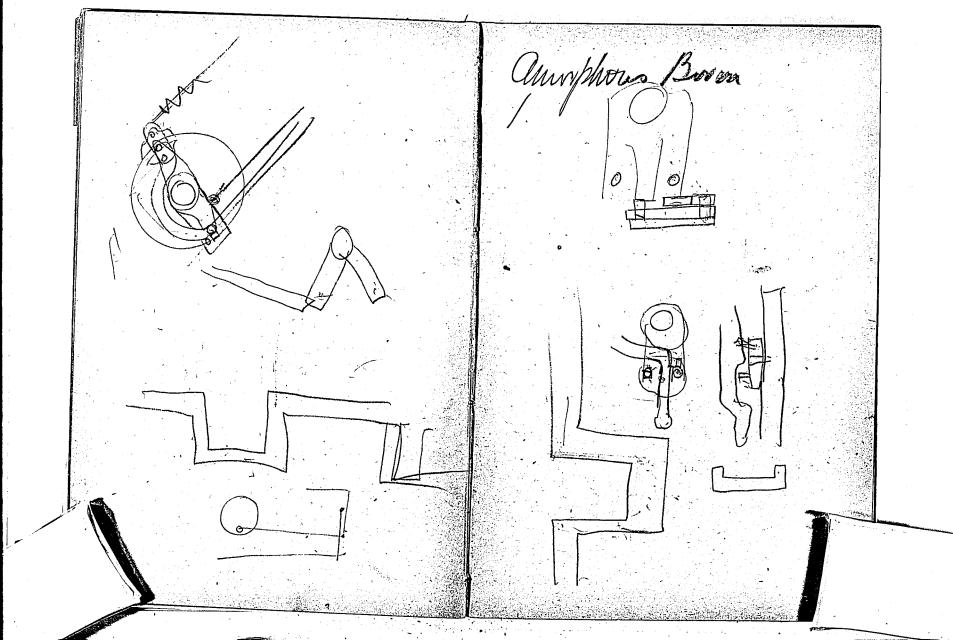
$$\frac{dW}{dw} = \frac{4E\varphi nw - \varphi^2 n^2 w^2}{b + \beta w^2}$$

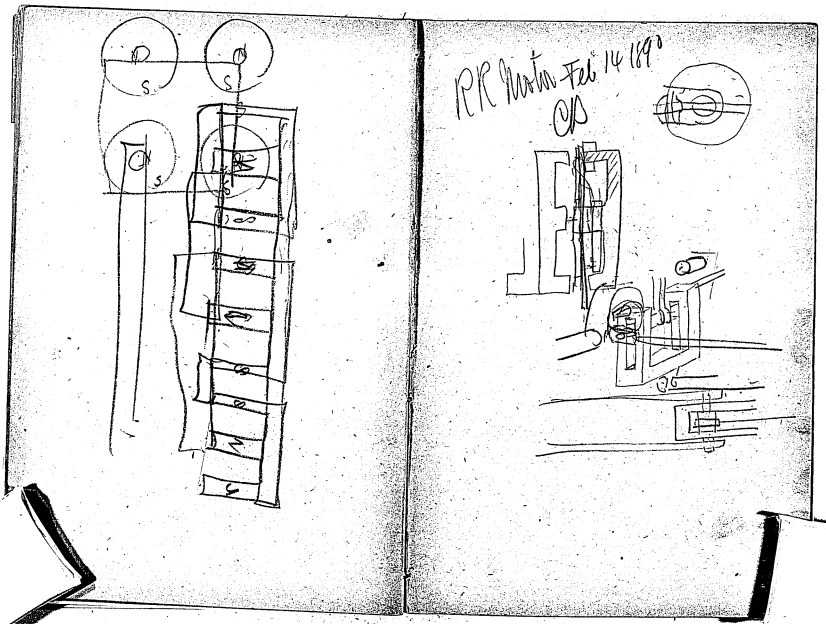
$$= \frac{(E\varphi n - 2w\varphi^2 n^2)(b + \beta w^2)}{(b + \beta w^2)^2} - \frac{2\beta w(E\varphi nw - \varphi^2 n^2 w^2)}{(b + \beta w^2)^2}$$

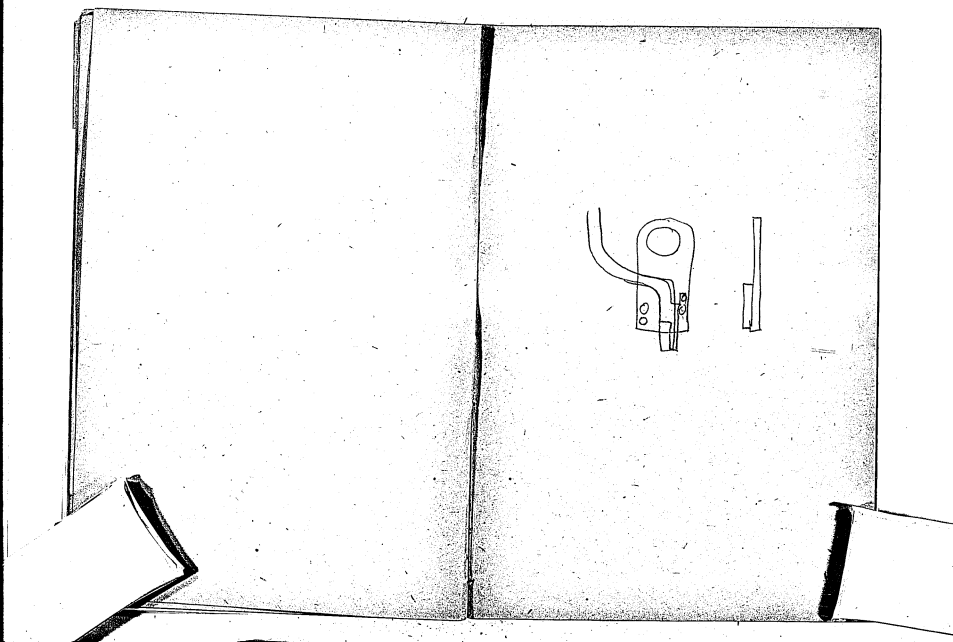
$$\therefore (E\varphi n - 2w\varphi^2 n^2)(b + \beta w^2) = 2\beta w(E\varphi nw - \varphi^2 n^2 w^2)$$

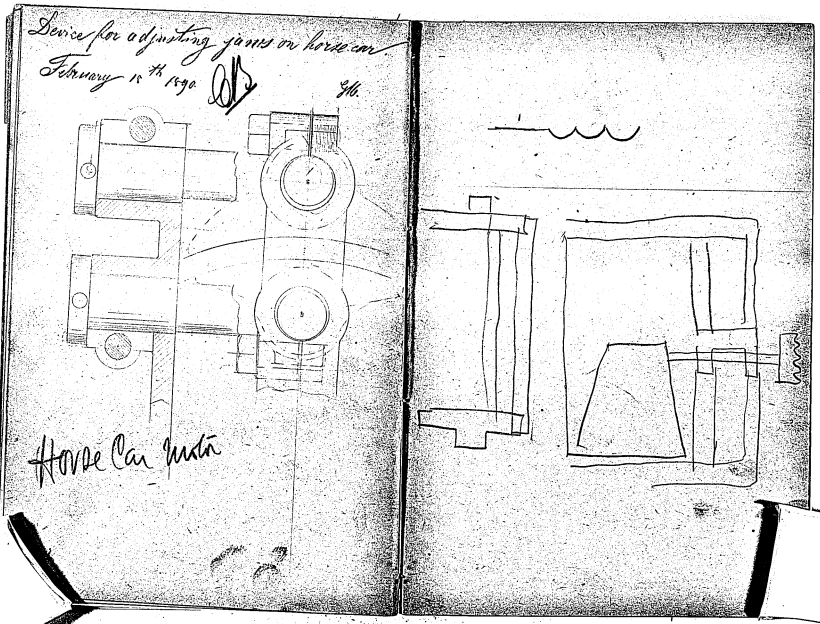
$$w \quad (E - 2\varphi nw)(b + \beta w^2) = 2\beta w(Ew - \varphi nw^2)$$



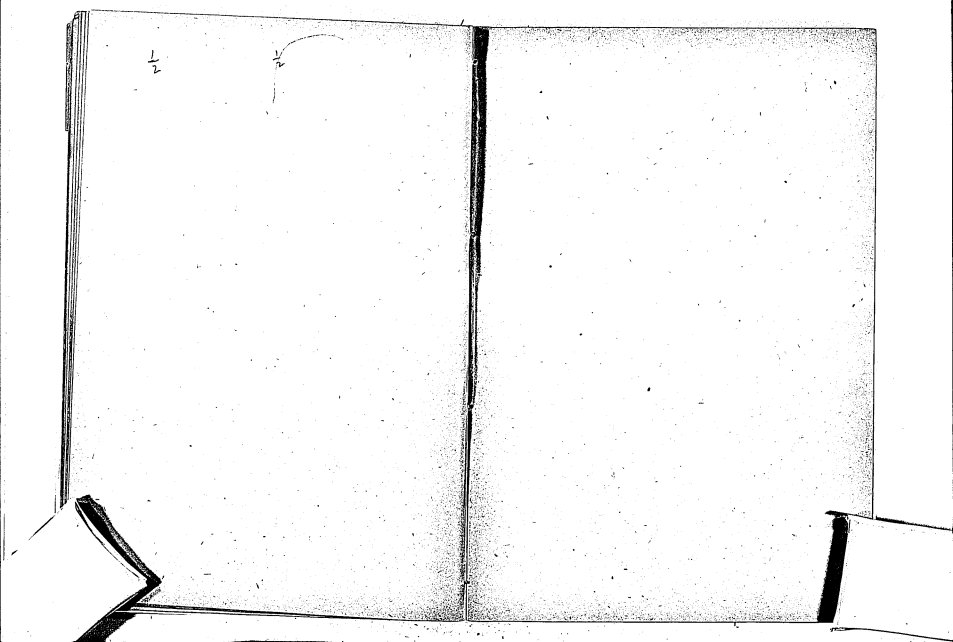

Amyphorus Bovem

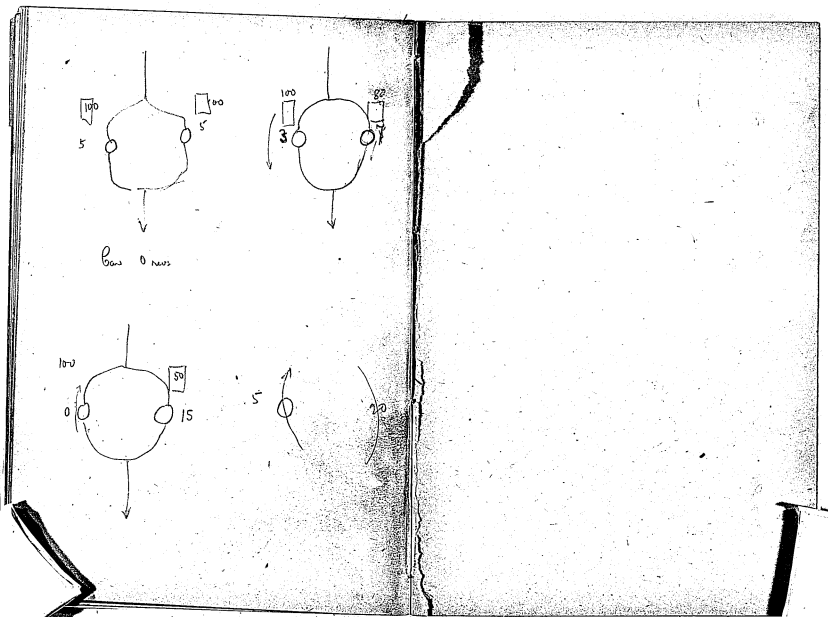

RR Martin Feb 14 1990




Device for adjusting jams on horse car
February 18th 1890
Horse Car Mule

Rotary Pump





14th 1890

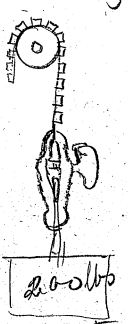
Mag Magnetic Belt-

A device for increasing adhesion of belting by means of a steel belt of .006 thickness and 2 ply— 3/4 inches wide with 1/4" square iron pieces riveted on outside 3/4 of 1" apart—

The Pulleys are Magnetic and turned with annular grooves for winding.

The belt with the Iron down on the outside completes

The Magnetic circuit giving an enormous grip. A test 4" Pulley with belt 4" wide and contact of 1/2 the circumference of Pulley sustaining about 200 lbs



Making transmission of Power by belting nearly as Positive as Gearing &

running practically noiseless
an endless belt on magnetic
Pulley of 4" diameter and
3/4 face driving Magnetic
Pulley of 12" diameter
In test - belt was run
at - about 1400 ft - per minute
but - could not - account the
strain of bending around the
Pulley

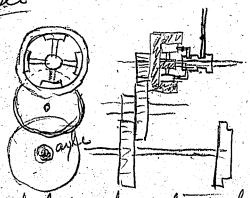
Belt weighs 15 lbs
and has 2.2 c faces

Weight of Breaki
on scale at 8 ft from
center 49 Pounds

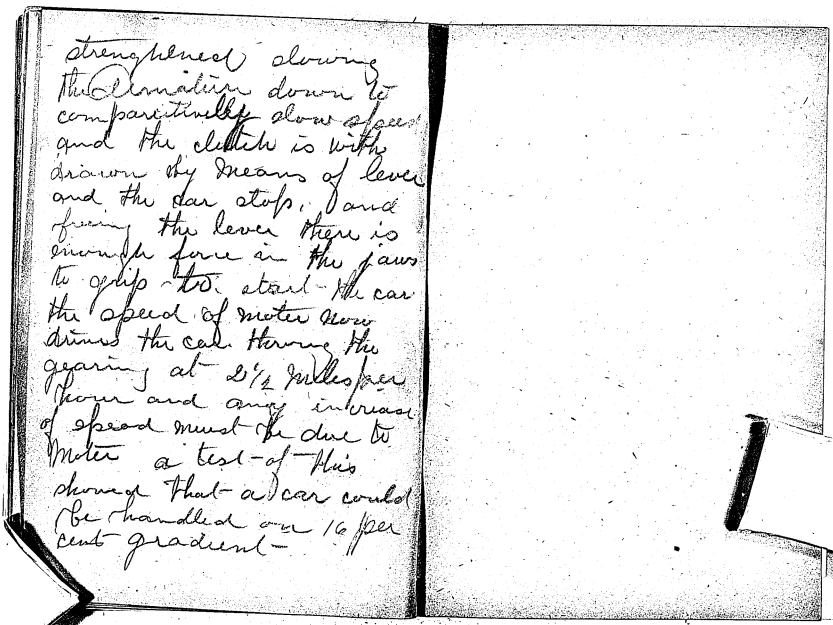
Aug 13th 1890

Centrifugal Clutch applied to street-cars

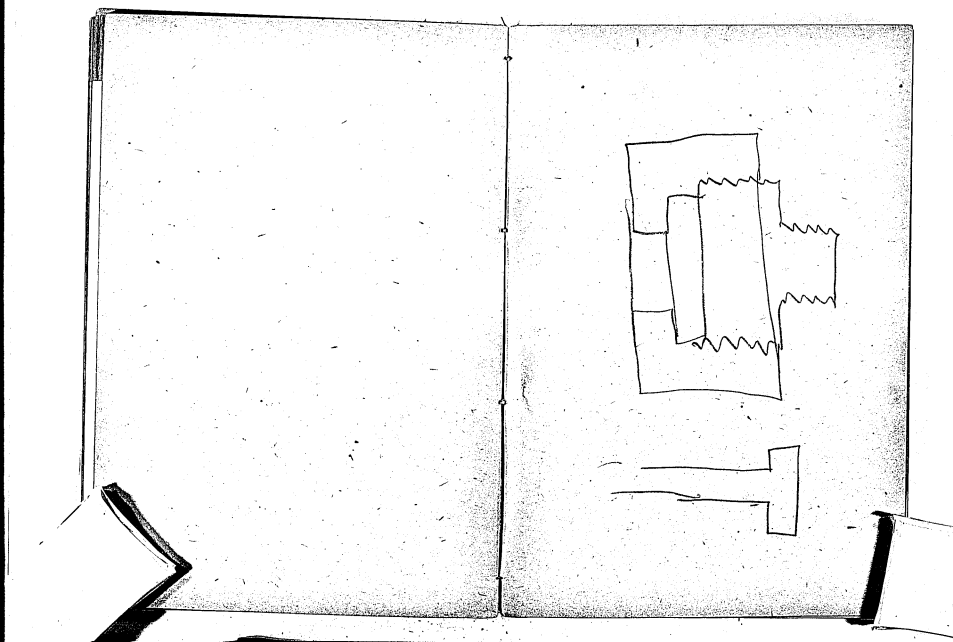
A device for starting and running street cars by means of a friction clutch that works automatic by centrifugal force, the device is attached to the armature shaft of the Motor and gearing to the axle

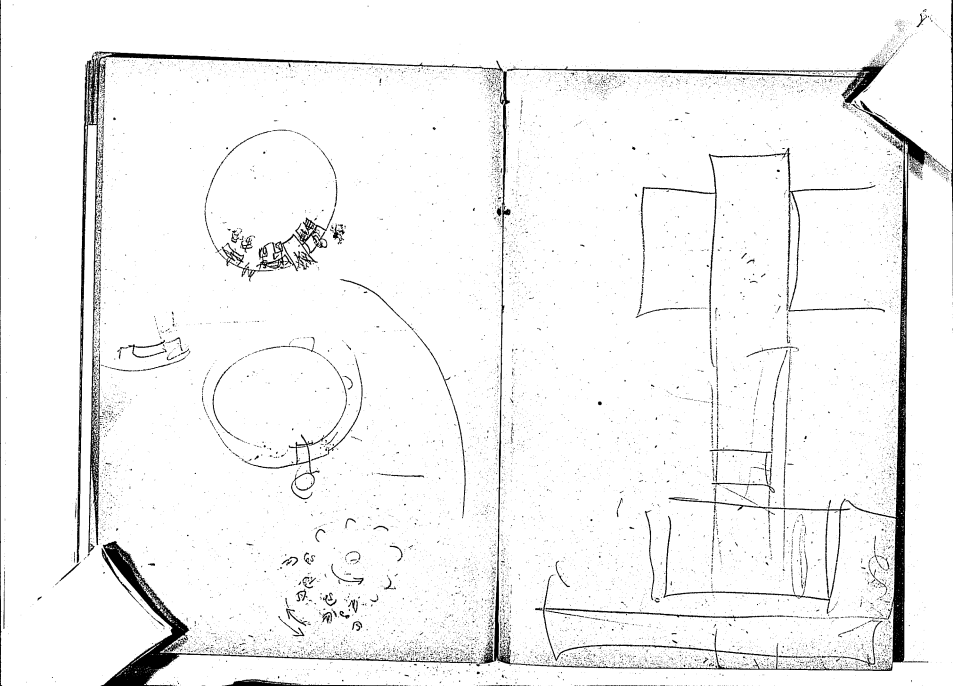


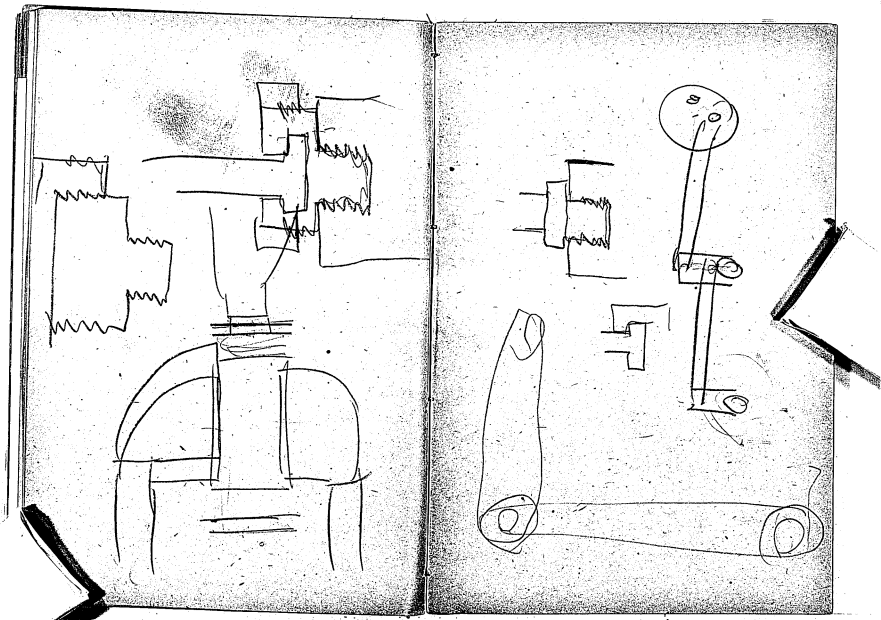
the fields of motor being

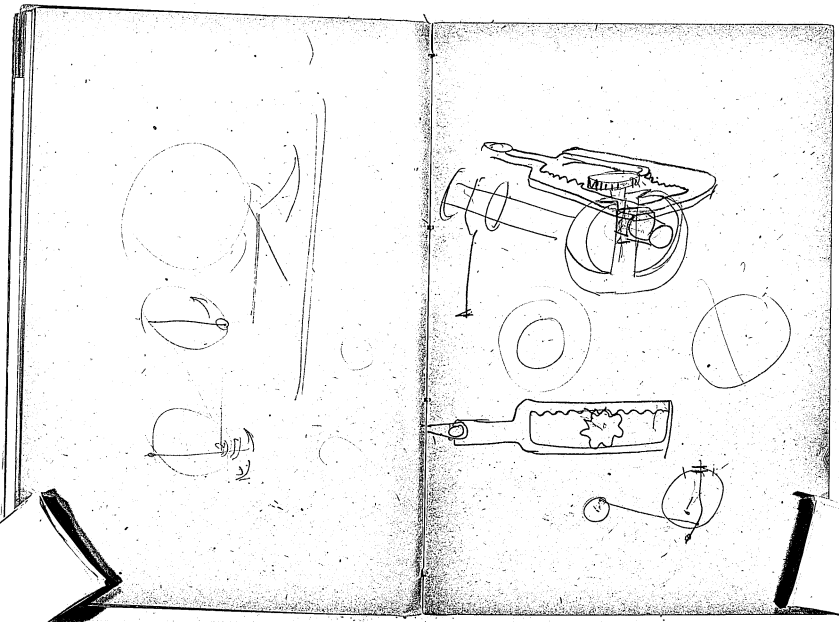


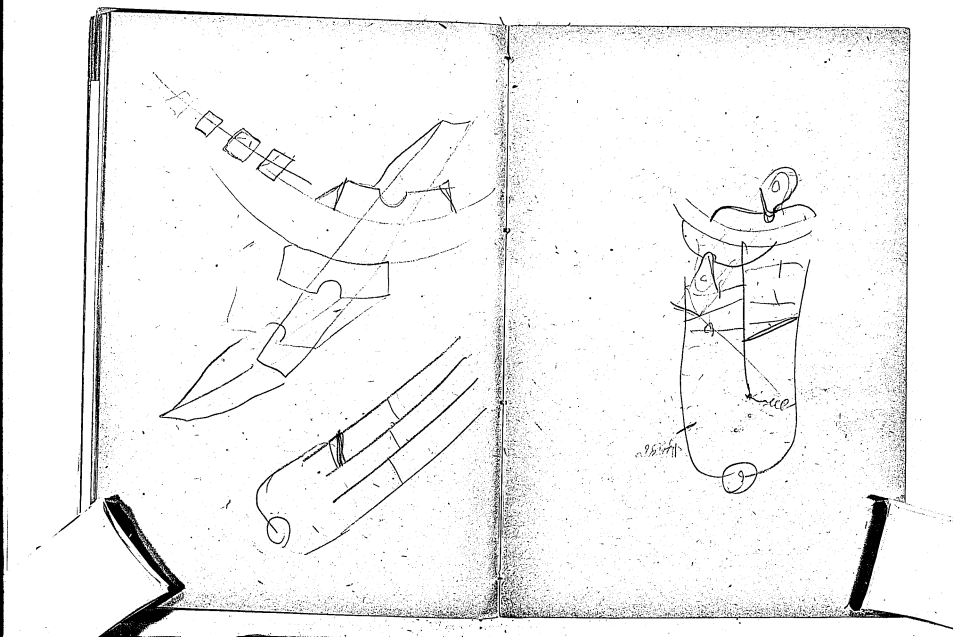
strengthened allowing the armature down to comparatively slow speed and the clutch is withdrawn by means of lever and the car stops. And from the lever there is enough force in the jaws to grip and stand the car the speed of motor now drives the car. Having the gearing at 2¼ miles per hour and any increase of speed must be due to Motor a test of this showed that a car could be handled on 16 per cent gradient—

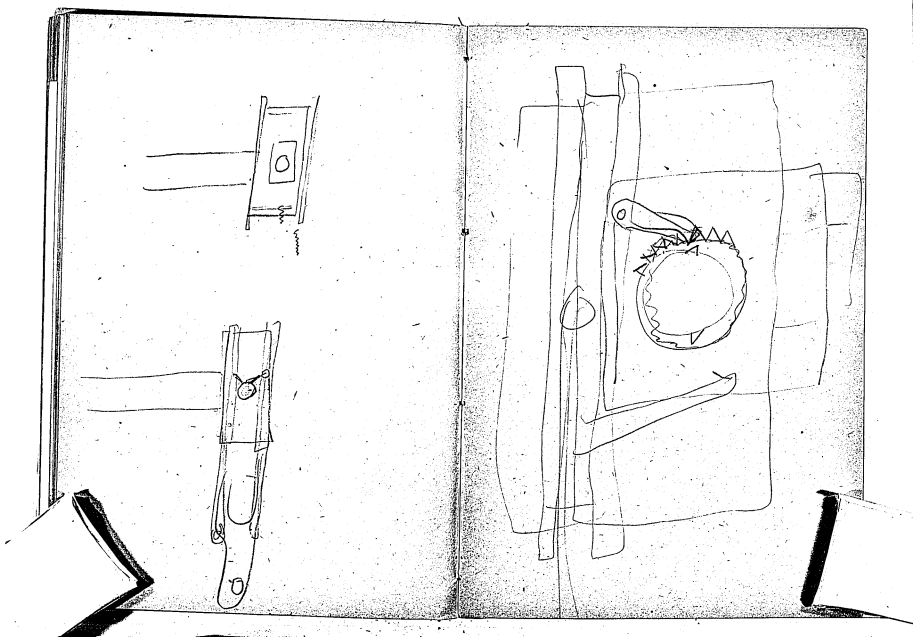


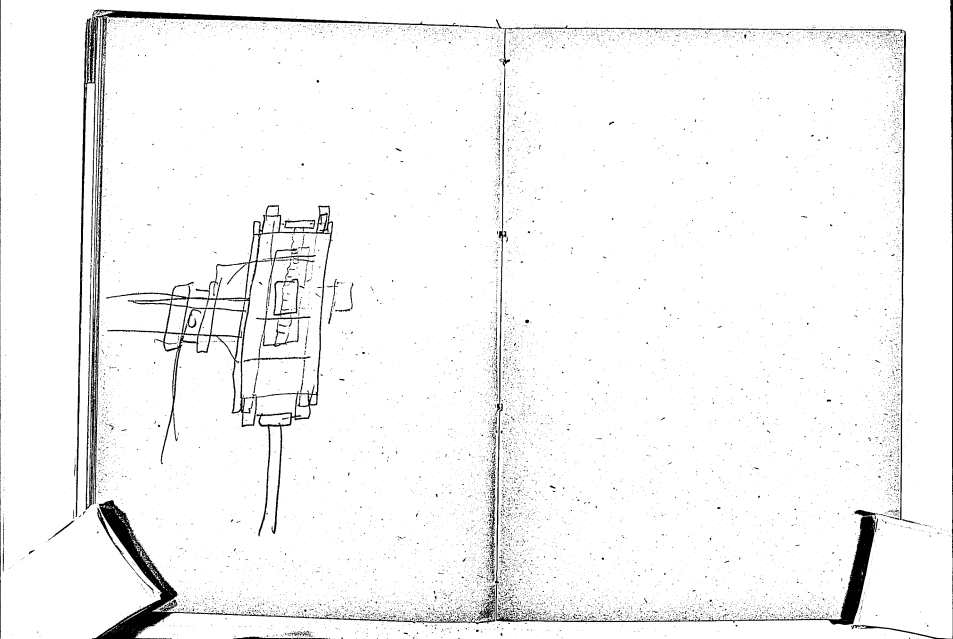


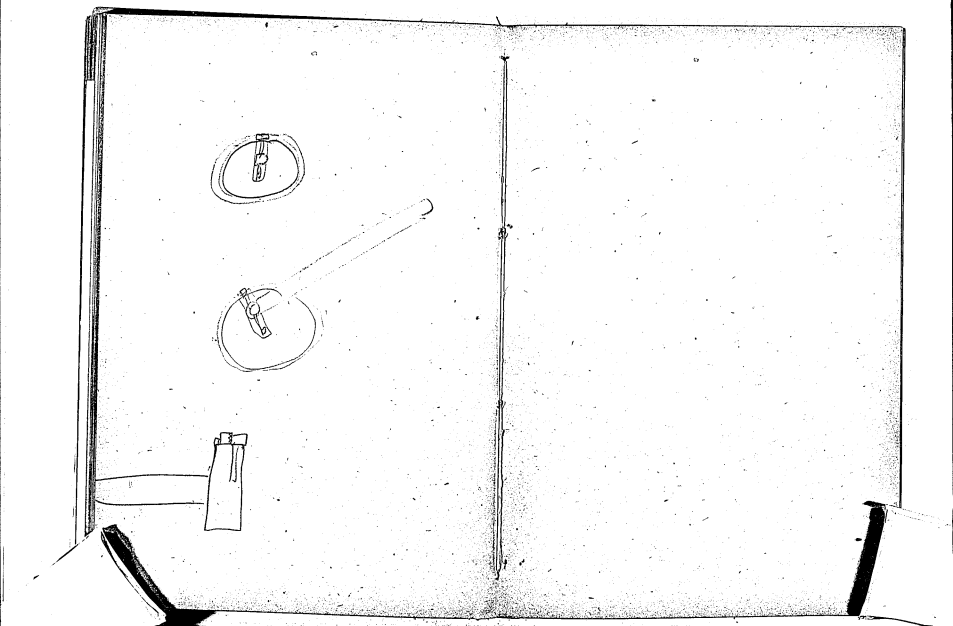


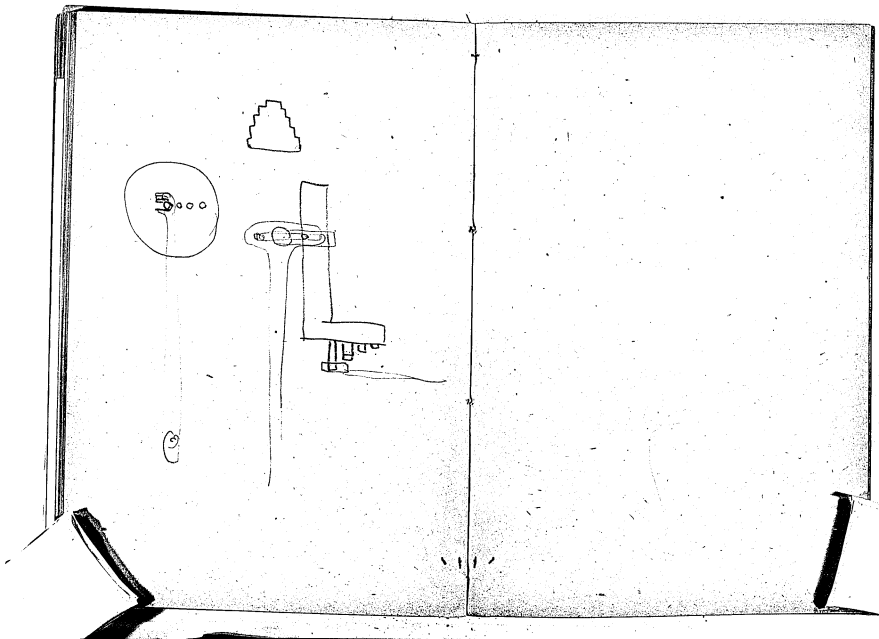


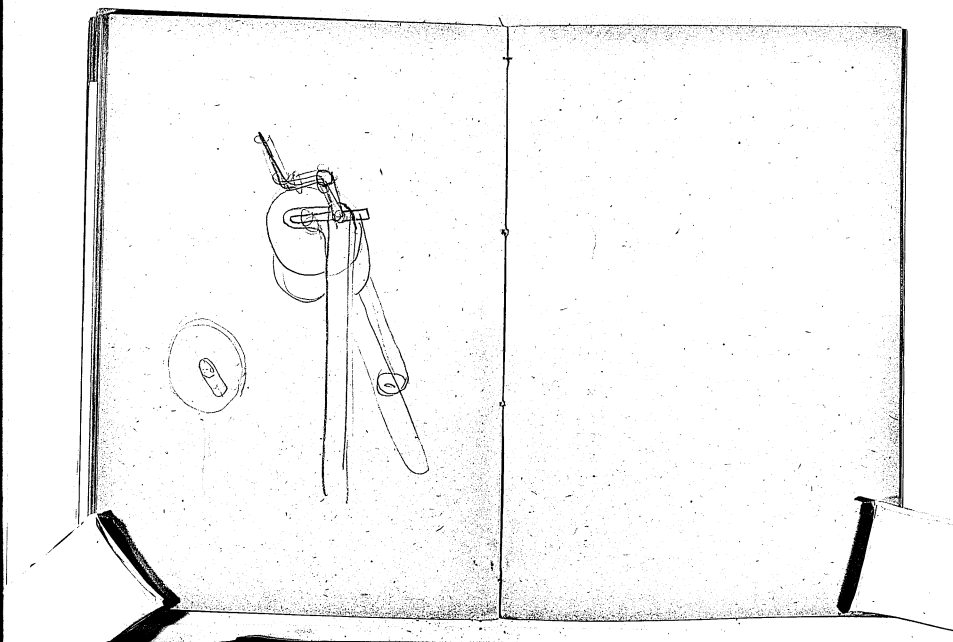


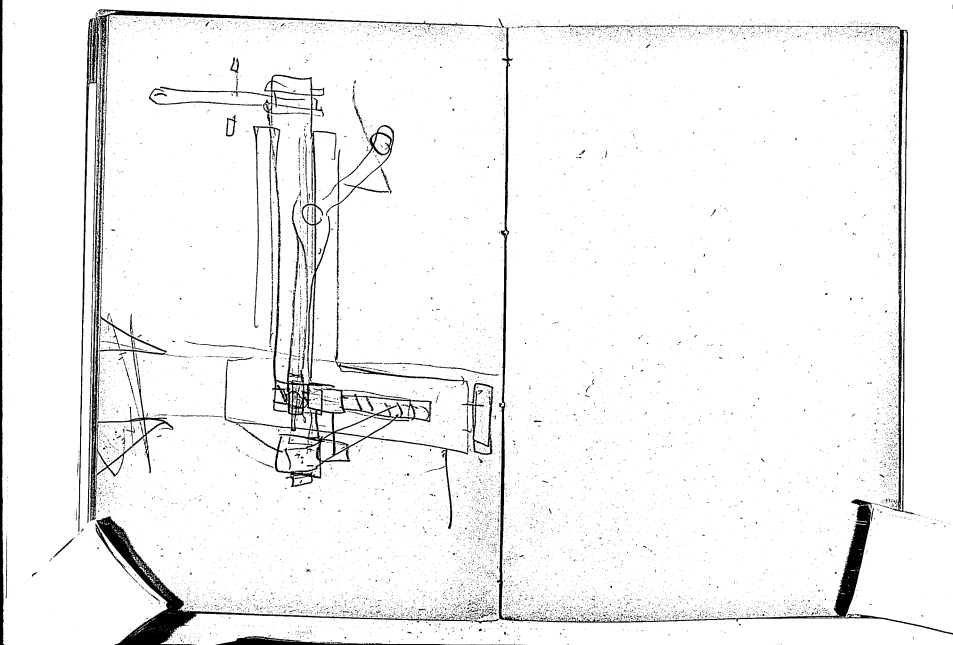


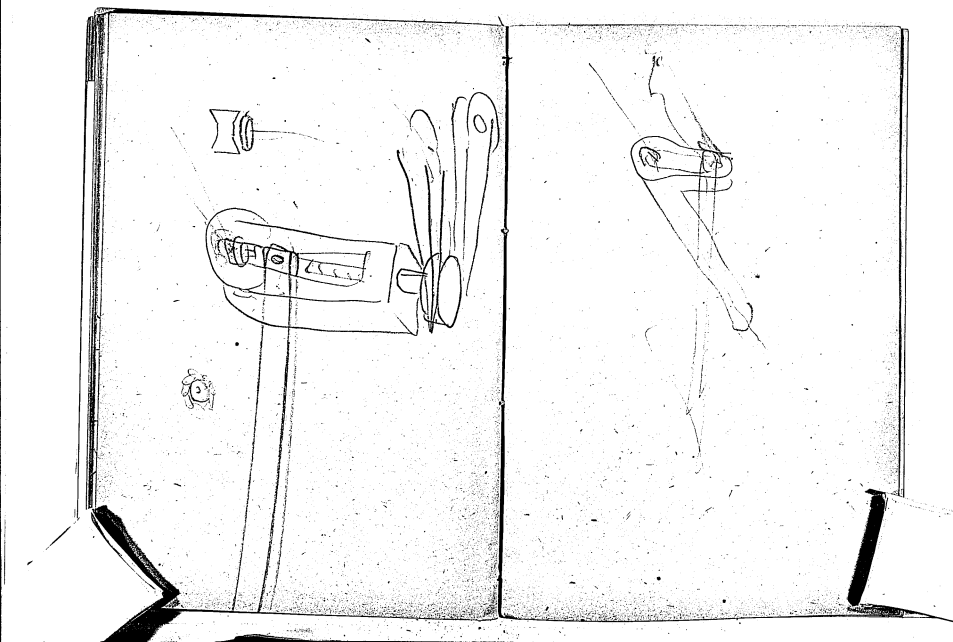


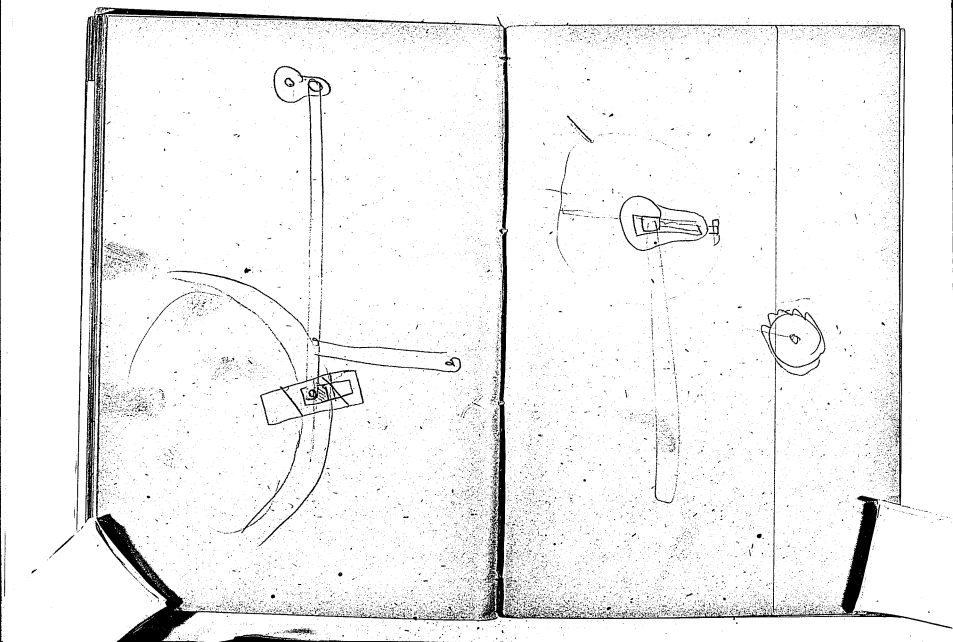


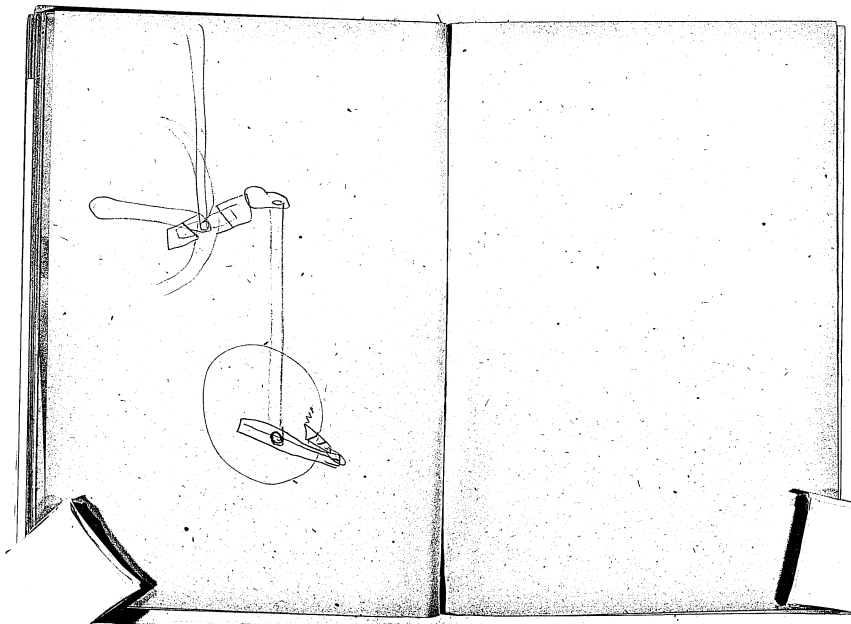


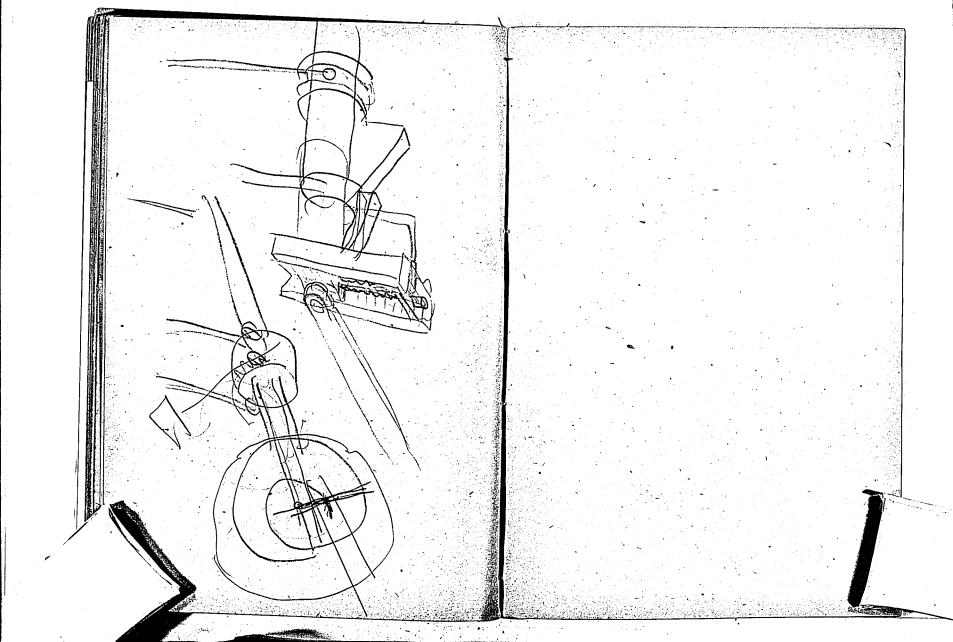


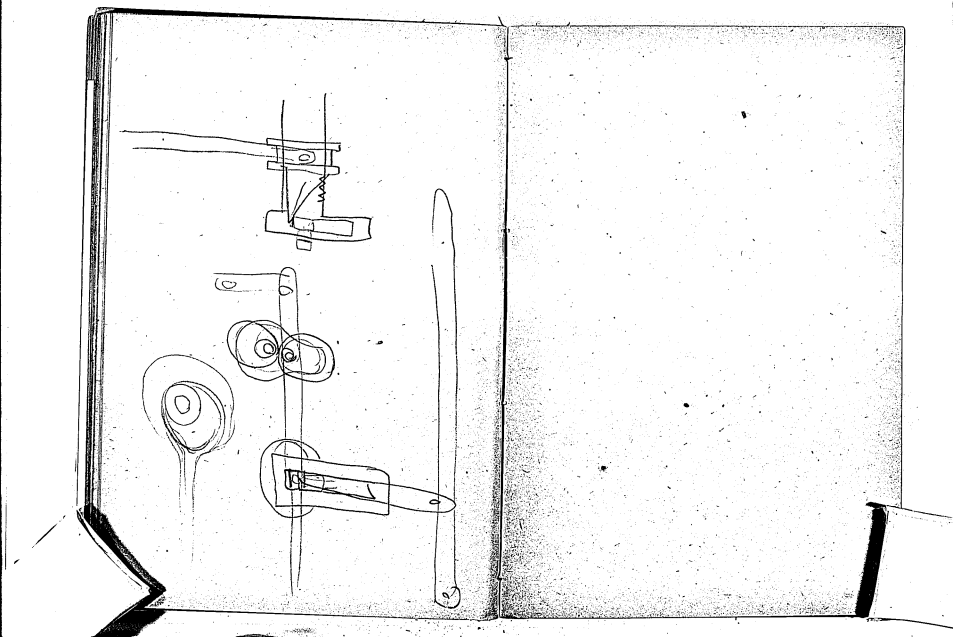


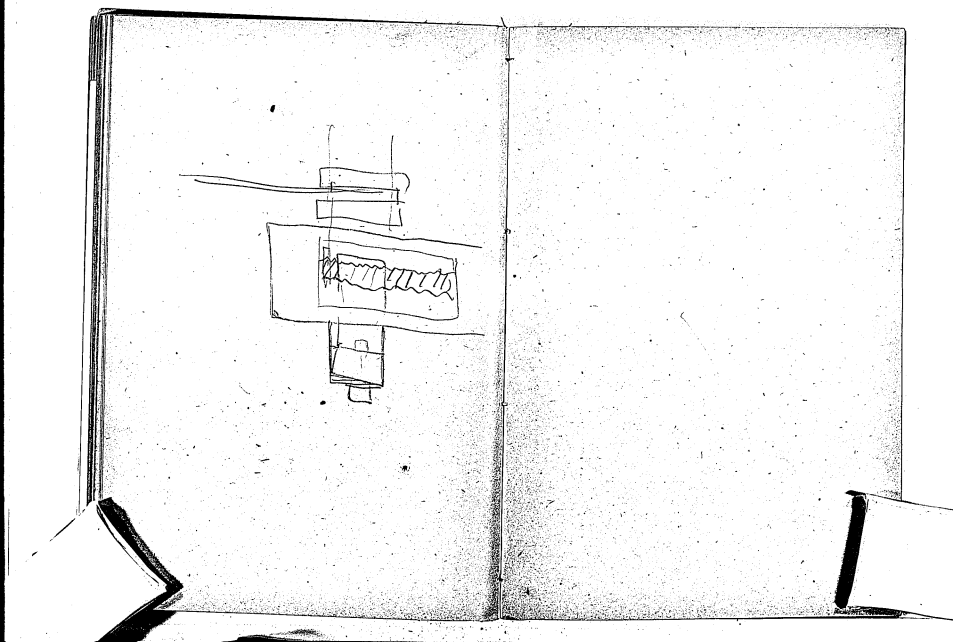


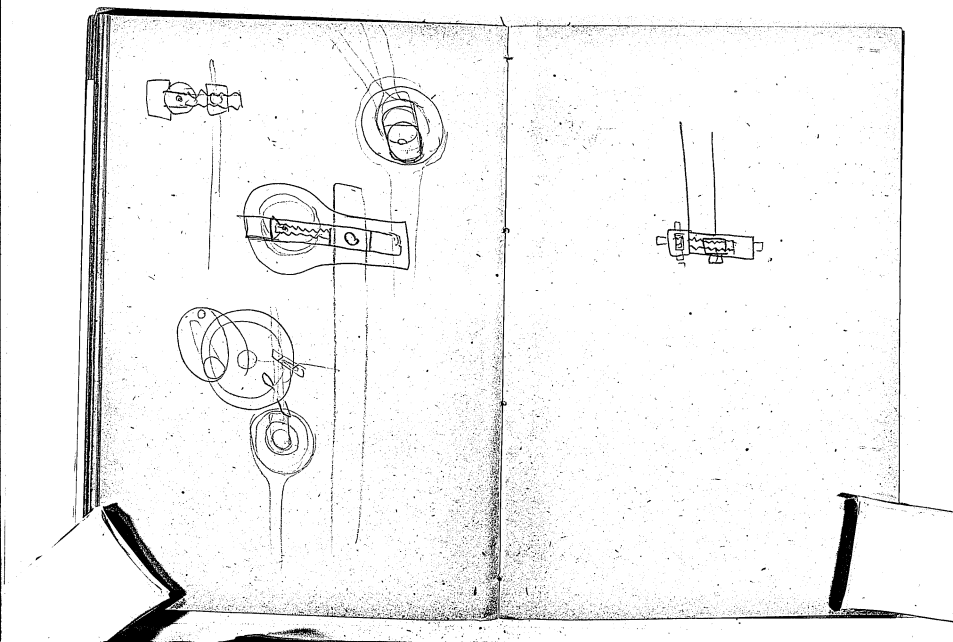


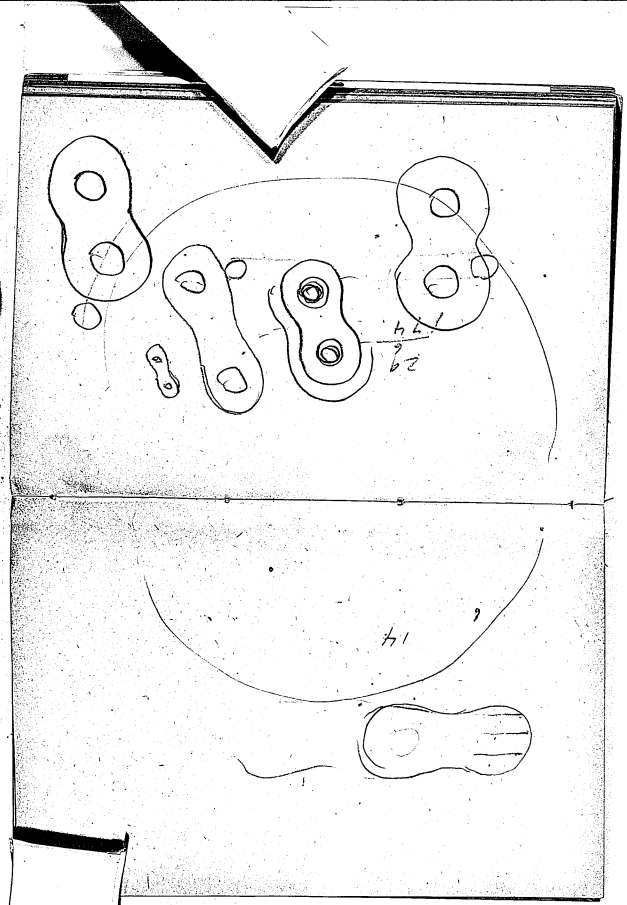


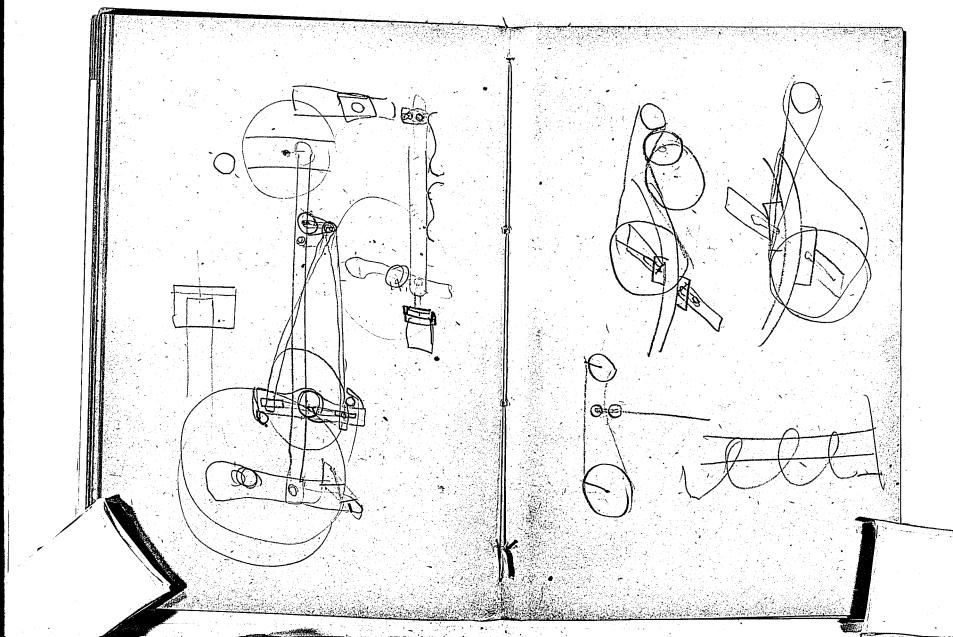


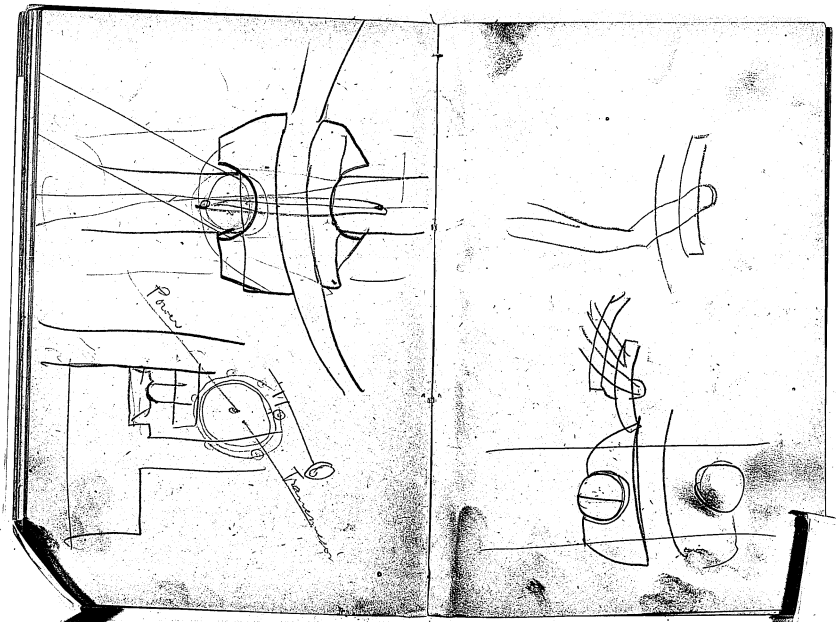


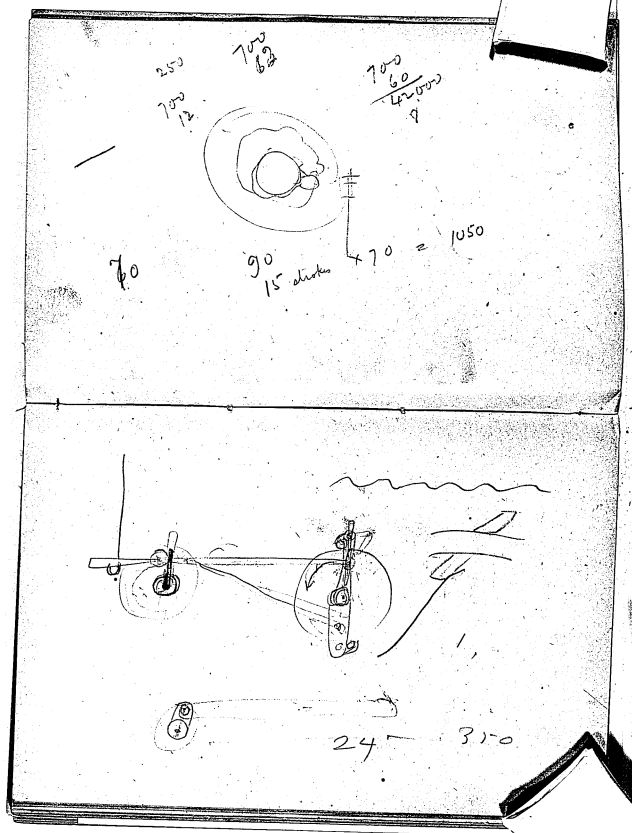


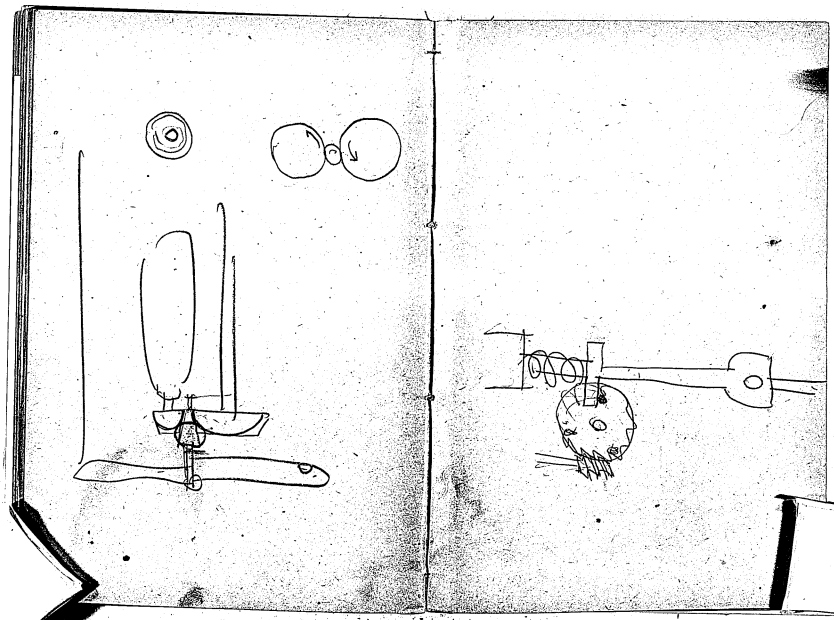


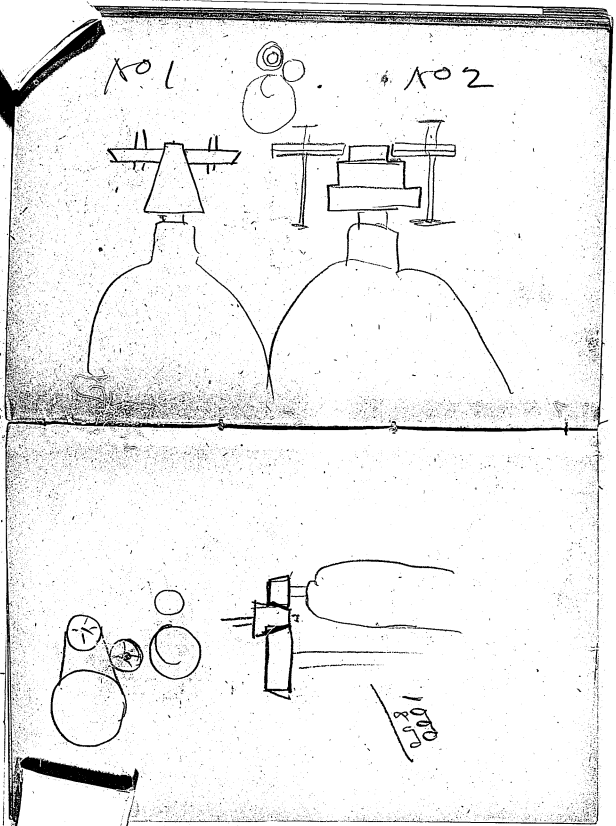


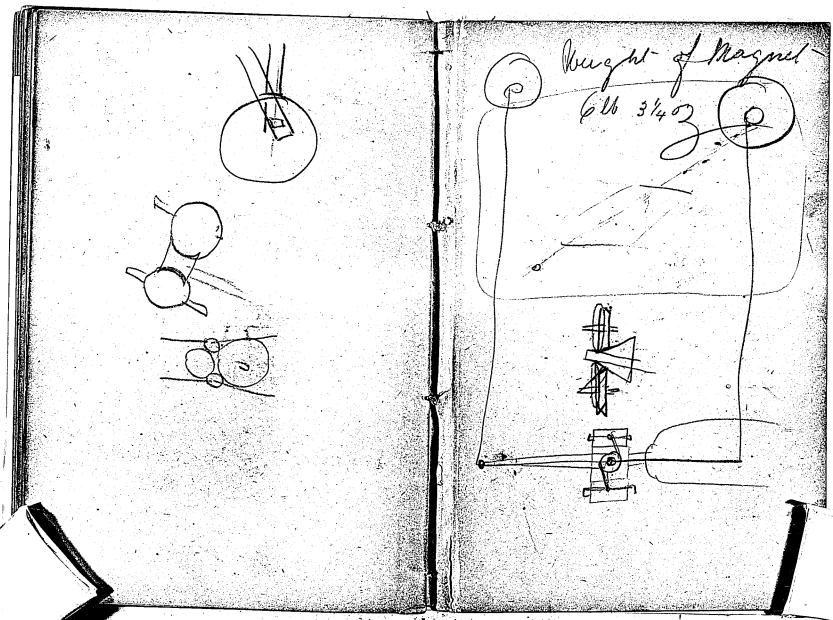



Pour
Transducteur


250
700
12
700
63
700
60
4200
90
15 strokes
70
1050
24
310




A01
A02


Weight of Magnet
6lb 3¼oz